

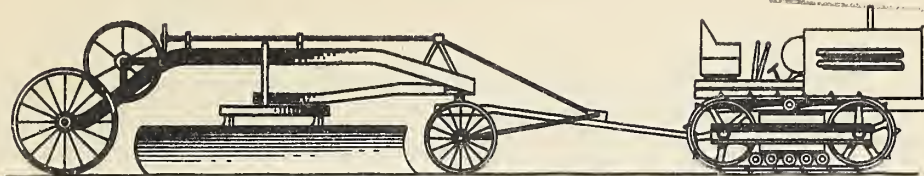
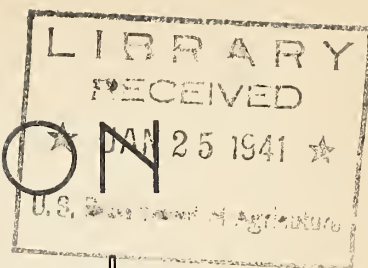
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# CONSTRUCTION



## HINTS

UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE

WASHINGTON, D.C.

Volume 6

December 1940

Number 11

Mr. T. R. Littlefield, Civil Engineer, Region 5, has submitted the following item concerning a safety measure which a local power company has found effective in preventing accidents where wet or slippery surfaces are a source of danger:

"On a recent inspection of the Kerckhoff power house (Fed. Pr. Comm. #96) I saw where one of the operators had slipped on a wet, greasy portion of the sloping steel penstock, resulting in a serious accident.

"The power house superintendent has since had all of the wooden, cement and steel walkways freshly painted and while the paint was still wet he had sprinkled on to the wet paint with a large-holed salt shaker some Norton Abrasive Grane No. 30.

"This made a surface on which it is impossible to slip. It is a safety device of considerable merit and probably could be used to good advantage in many places throughout the Forest Service where wet or slippery surfaces are a source of danger."

On pages 2 and 3 will be found an illustrated article prepared by Mr. D. M. Hamilton of the Washington office on the operation of tractors equipped with hydraulically controlled trailbuilders.

A safety device for holding a tool box lid open, designed by Mr. Creed Caldwell, Superintendent CCC Camp P-61, Sheridan, Arkansas is shown on page 4.

A blasting cap magazine, designed and constructed by Superintendent Ralph Snyder, Camp S-144, Akeley, Minnesota, is described and illustrated on pages 5 and 6.

E. S. MASSIE, Jr.,

## NOTES ON OPERATION OF TRACTORS EQUIPPED WITH HYDRAULICALLY CONTROLLED TRAILBUILDERS

Tractors equipped with hydraulically controlled trailbuilders should not be travelled or moved on their tracks with the blade in the extreme lift position. This high lift locks out of the vertical oscillation or independent vertical movement between the tractor treads, and throws the entire strain caused by ground irregularities into the trailbuilder mechanism.

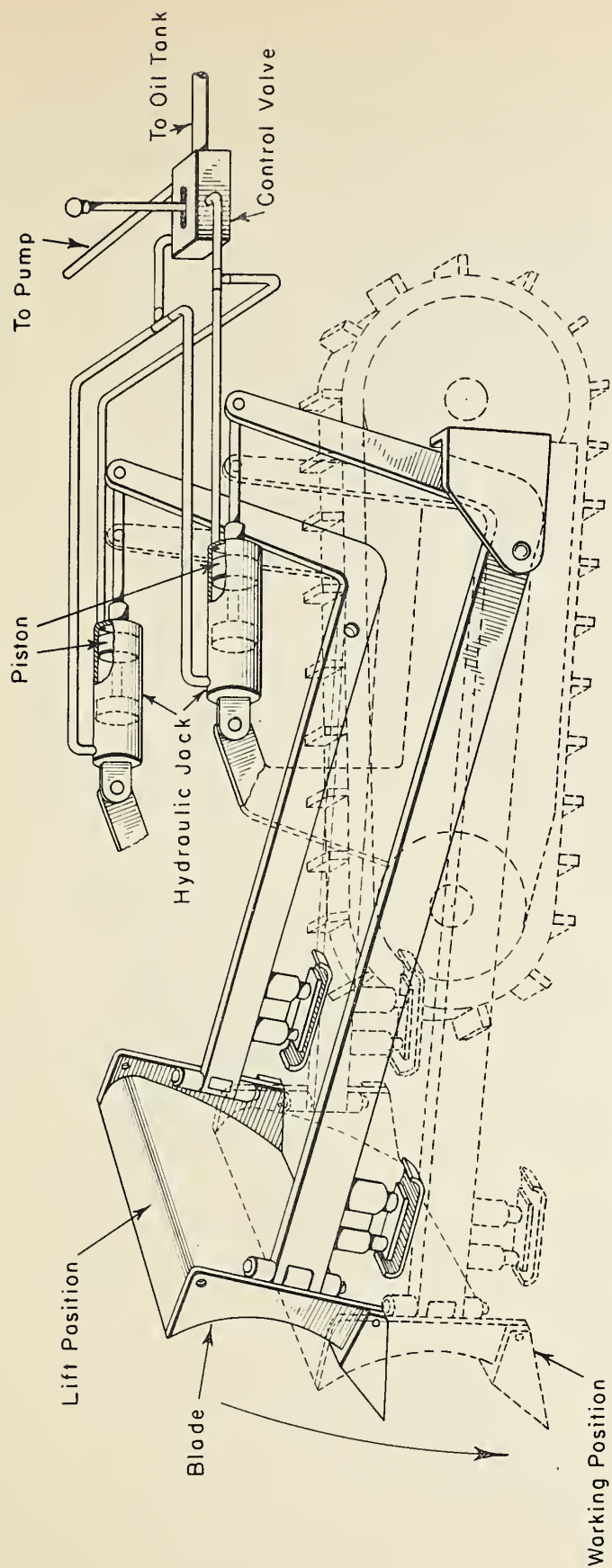
The following explanation and attached sketch should make this clear.

If the front end of the left-hand tread should rise over a rock or other obstruction, the whole trailbuilder mechanism on that side would tend to rotate with it about the rear pivot. The blade, however, would resist this rise.

If then, the blade is all the way up, and the right-hand piston has reached the end of its stroke, the oil that would tend to be displaced from the left-hand cylinder cannot cause any movement of the right-hand piston. The force is therefore transmitted through the blade to the right-hand trailbuilder mechanism, which will in turn raise the right-hand tread. Except for the play permitted by slack in the trailbuilder connections, no vertical oscillation of the tractor treads can occur.

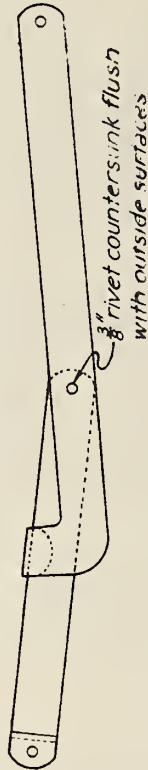
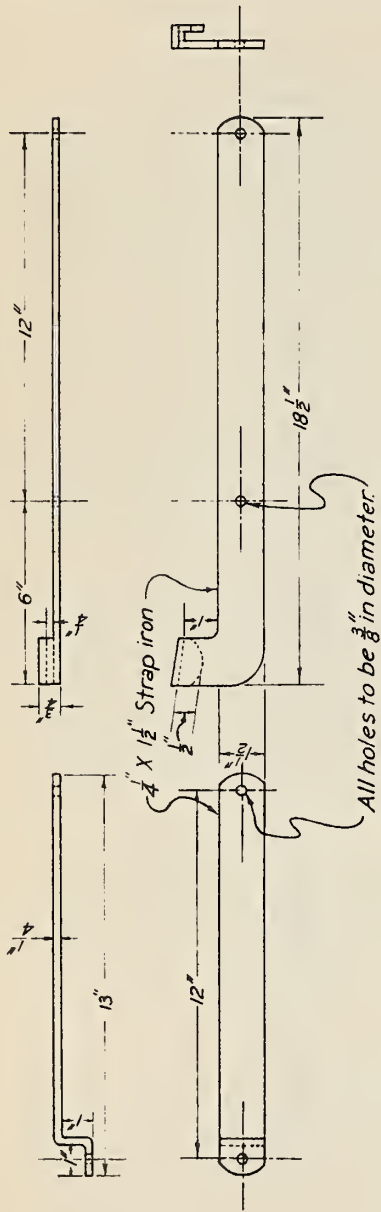
The forces set up under these conditions have high impact values, which throw undue stress on all trailbuilder parts. The points at which failure may occur will, of course, depend on the design of the trailbuilder. Such failures have been observed in moldboards, yokes, bellcranks, lift arms, and piston rods.

On the other hand, if the blade were in the midposition or at any point except at the end of its travel, the piston would be at some midposition in the cylinder. Further reference to the sketch will show that, if the blade resists the tendency to rise, the piston will tend to remain in its position, and as the cylinder moves with the rising track, it will displace some oil. This oil will move to the right-hand cylinder. If the right-hand piston is in some midposition, the oil displaced from the left-hand cylinder will force it back, raise the right-hand end of the blade, and hence counteract the resisting tendency of the blade. The blade can therefore be said to be floating, and no harm will be done.



## HYDRAULICALLY CONTROLLED TRAILBUILDER

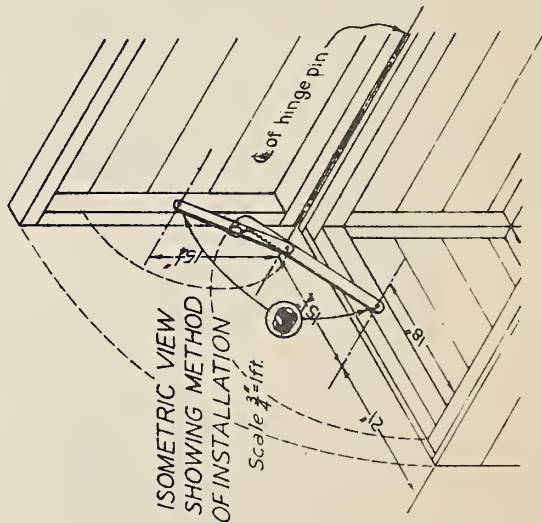
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NOTE: To insure proper functioning of this device it is absolutely necessary that all holes in the box, lid, and arm be drilled as shown by dimensions.

# SAFETY DEVICE FOR HOLDING TOOL BOX LID OPEN

Scale 3/4"=1ft.



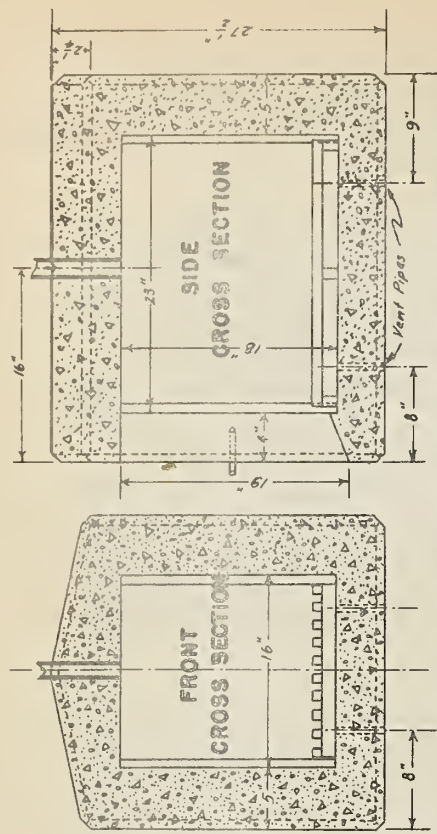
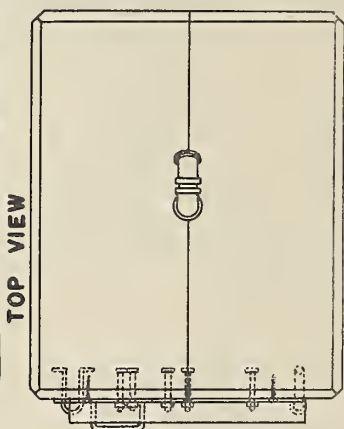
Designed by Creed Caldwell,  
Superintendent CCC Camp P-61,  
Sheridan, Arkansas.

DRAWN BY	DATE	CHECKED BY	APPROVED DATE
THOMAS	8-15-40	W. J. S.	8/18/40
CENTRAL DRAFTING OFFICE			CAMP P-61

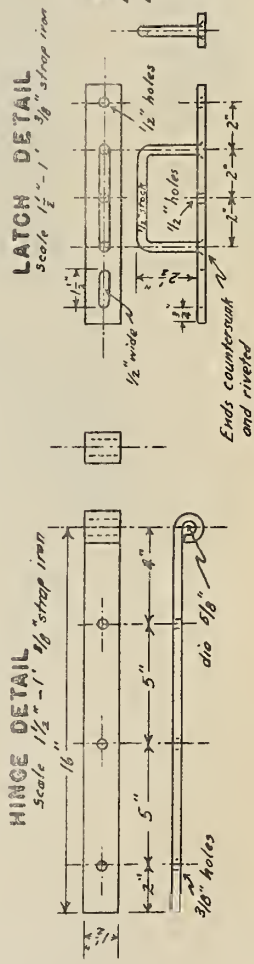
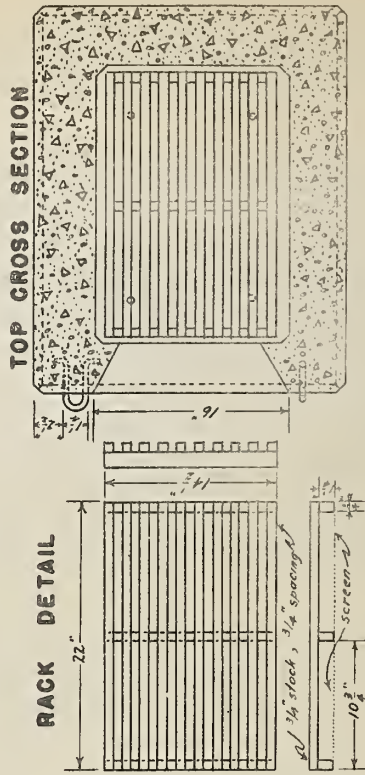
Mr. L. R. Beatty, Acting Director, State CCC, Minnesota Department of Conservation, in forwarding the plan for the blasting cap magazine illustrated on page 6 states:

"After experimenting with many types of cap magazines to comply with CCC regulations with varying success and always resulting in a considerable investment of materials and labor to safe-guard the explosives, Superintendent Snyder constructed one of concrete which resembles and operates like a safe. The concrete cap magazine is a solid structure weighing approximately 1,000 lbs. with a beveled concrete door affixed to the magazine with iron strap hinges. We will supply each one of our camps with a plan showing the details and will make this magazine standard in all of our camps due to its fire and bullet proof construction and its mobility for moving from one camp to another by truck, thus saving the expense of constructing a fixed structure."

This type of box is best adapted for more or less permanent camps because of its cumbersome nature. The policy now followed in the field is to locate a standard magazine at Supervisors' headquarters or similar central location from which a few days supply of caps are taken for a project. The project boxes are of about one cubic foot capacity, metal covered and insulated with 4" of sawdust.



CLASS "A" CONCRETE, REENFORCED-Point Outside (Red)  
to keep concrete from absorbing moisture. Point all iron  
aluminum.



**BLASTING CAP MAGAZINE**  
Designed by Supt. Ralph Snyder  
Drawn by Asst. Leader Eino E. Lohf  
C.C.C. CAMP 5-144,  
AKELEY, MINN.  
Scale  $\frac{3}{4}$ " = 1' date: 10/23/40

BLASTING CAP MAGAZINE